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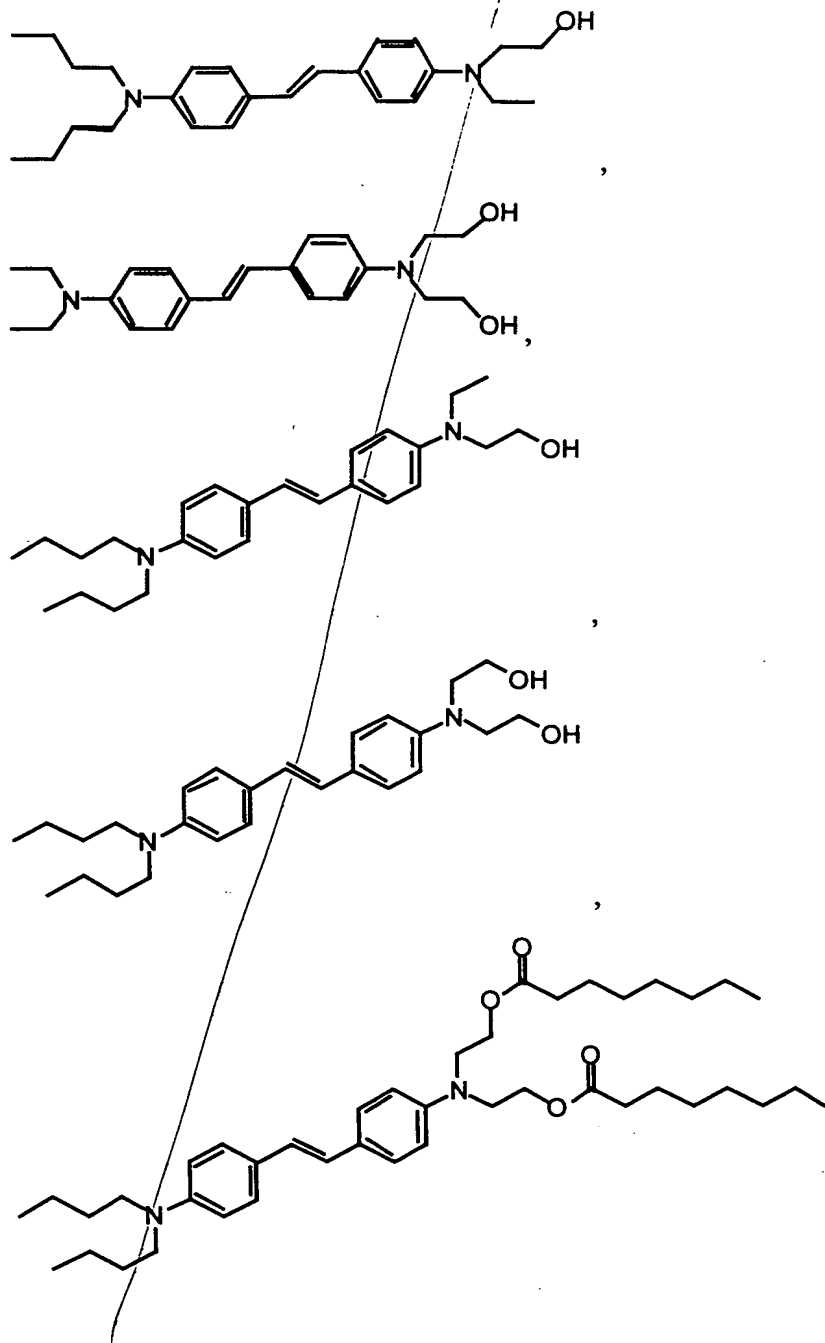
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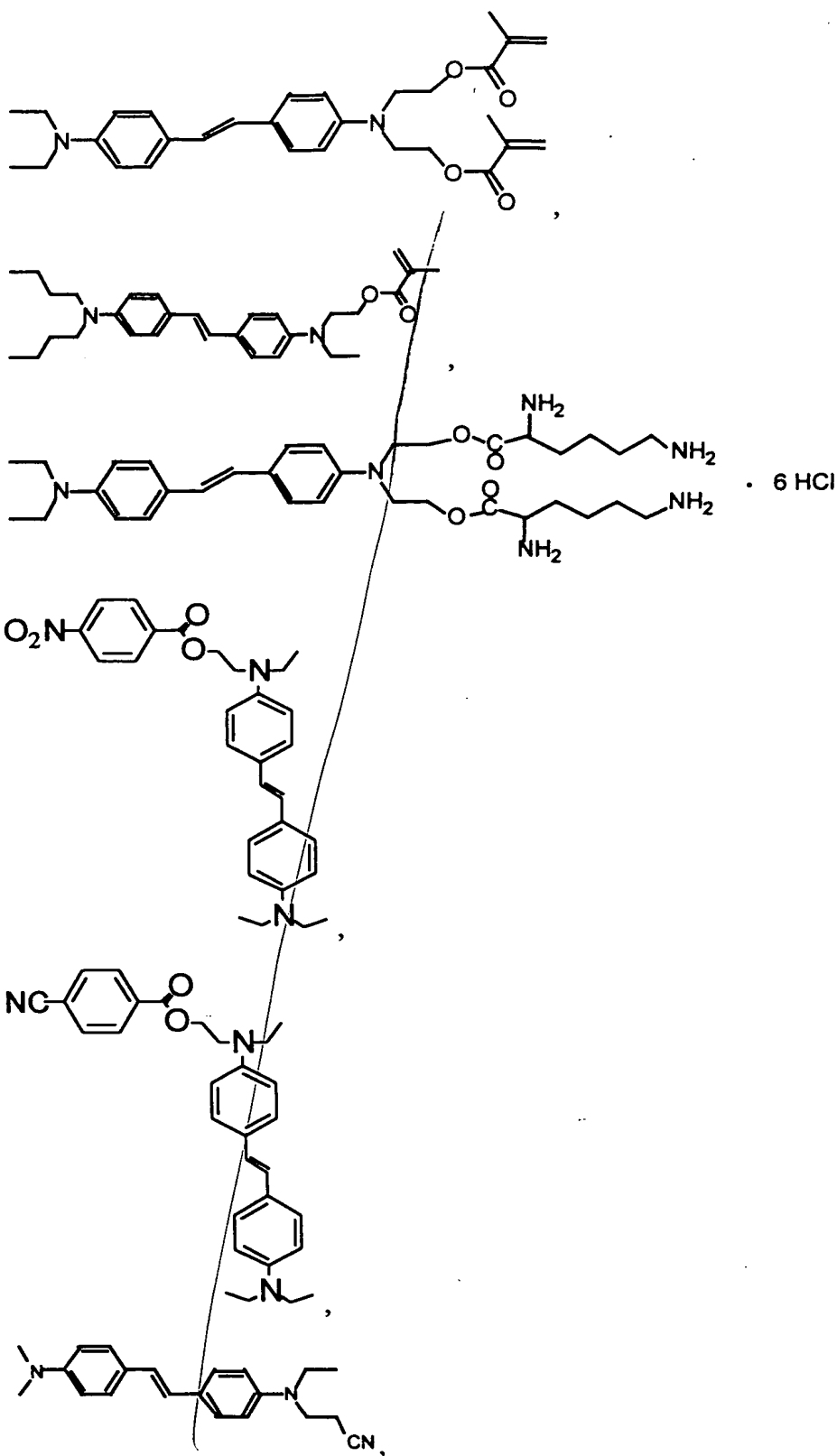
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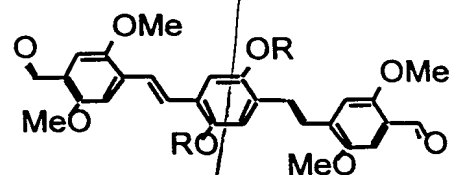
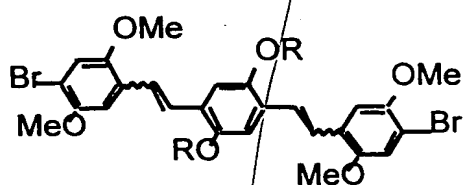
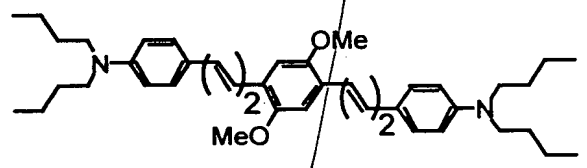
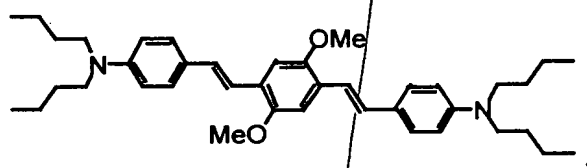
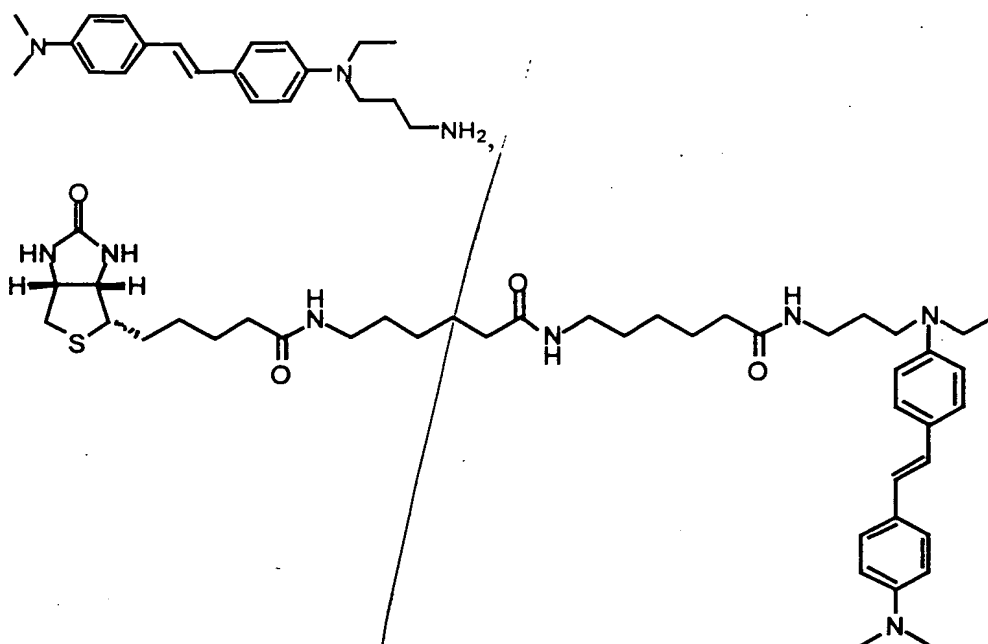
1. A composition capable of simultaneous two-photon absorption comprising a compound selected from the group consisting of

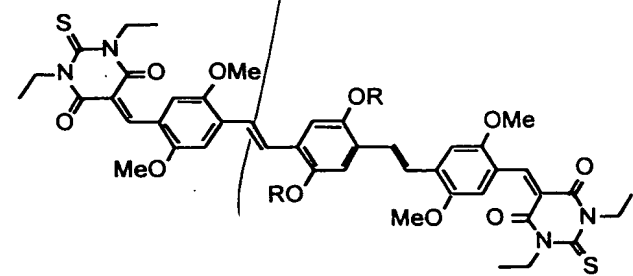
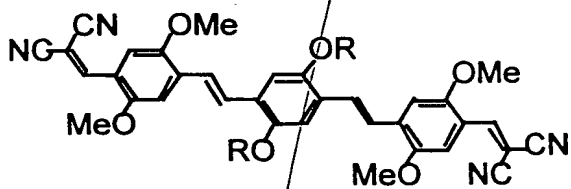
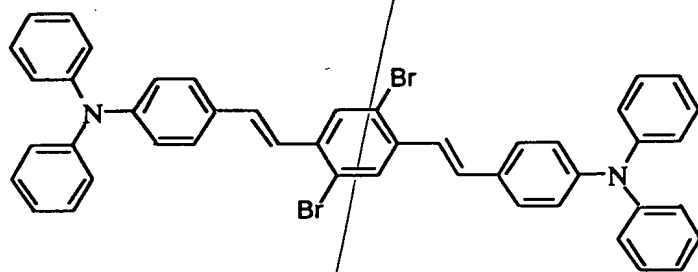
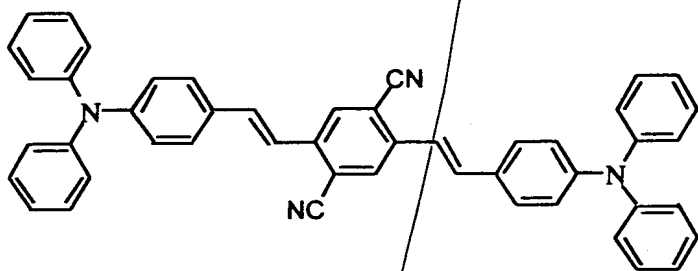
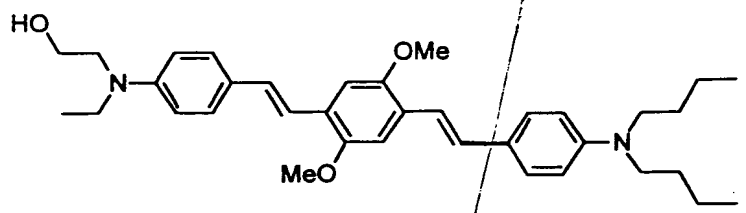
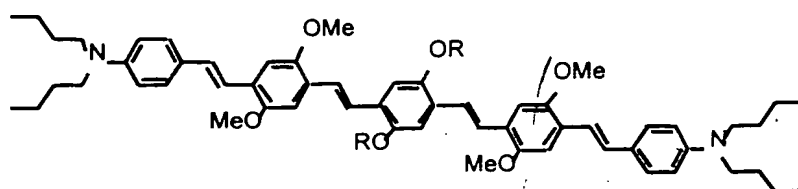


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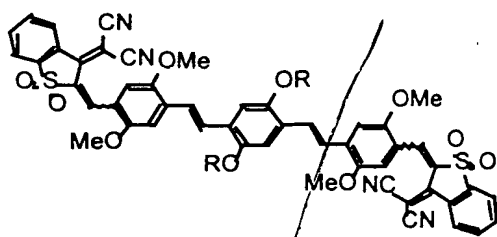


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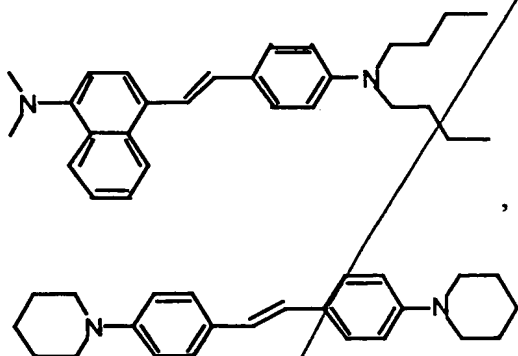


and mixtures thereof, where $R=(CH_2)_{11}CH_3$.

2. A method for preparing a compound in an electronically excited state, comprising the steps of:

- a) exposing a compound having the formula $D_1-\Pi-D_2$ to radiation, wherein D_1 and D_2 are electron donor groups; and Π comprises a bridge of π -conjugated bonds connecting D_1 and D_2 ; and
- b) converting said compound to a multi-photon electronically excited state upon simultaneous absorption of at least two photons of said radiation by said compound, wherein the sum of the energies of all of said absorbed photons is greater than or equal to the transition energy from a ground state of said compound to said multi-photon excited state and wherein the energy of each absorbed photon is less than the transition energy between said ground state and the lowest single-photon excited state of said compound and is less than the transition energy between said multi-photon excited state and said ground state.

3. A method according to claim 2, wherein said compound is selected from the group consisting of

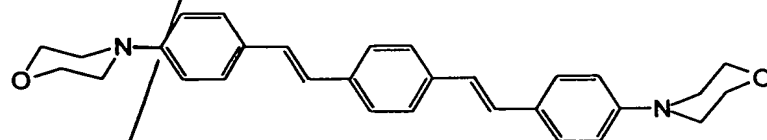
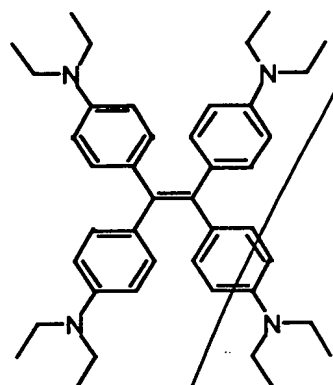
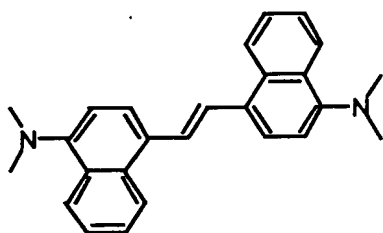
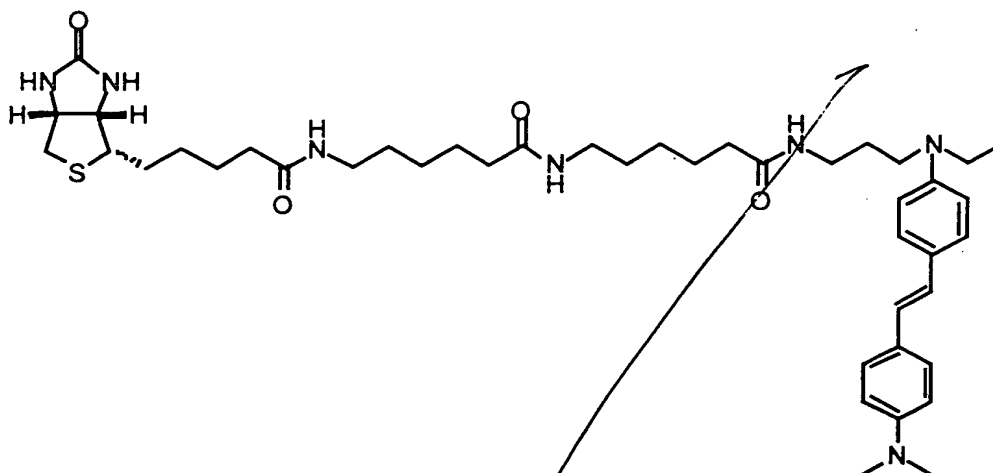


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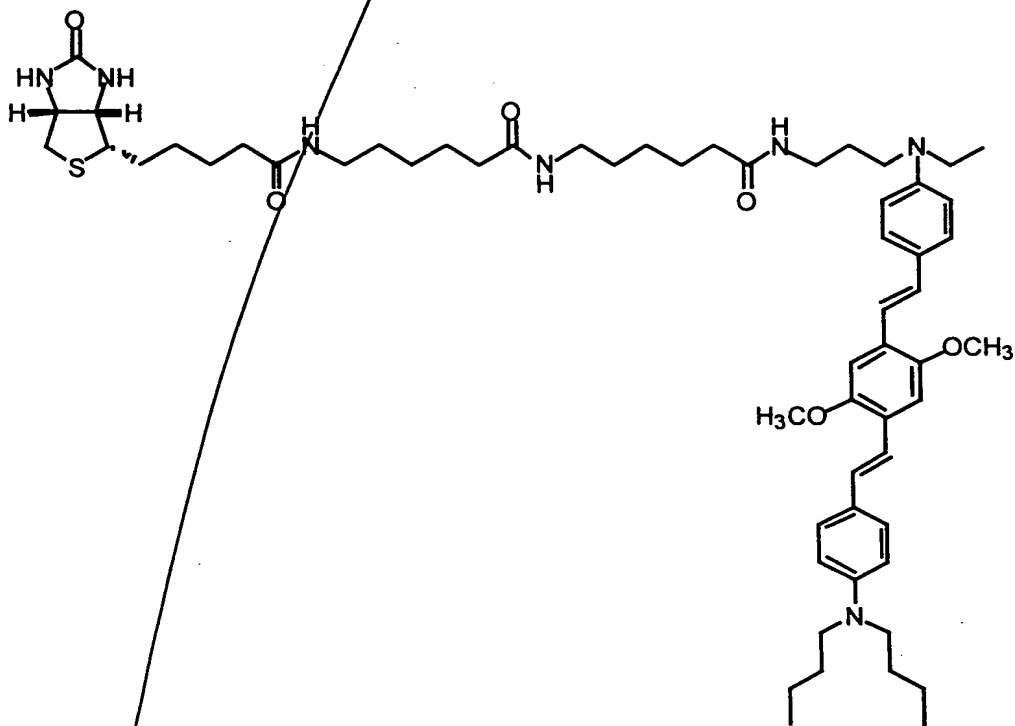
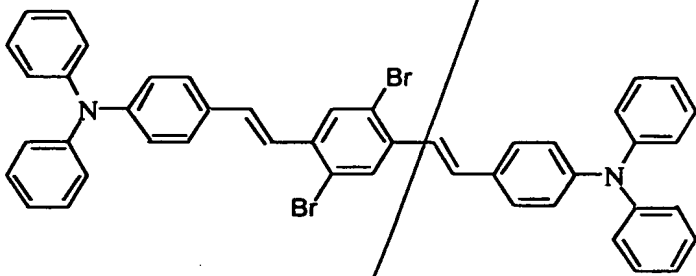
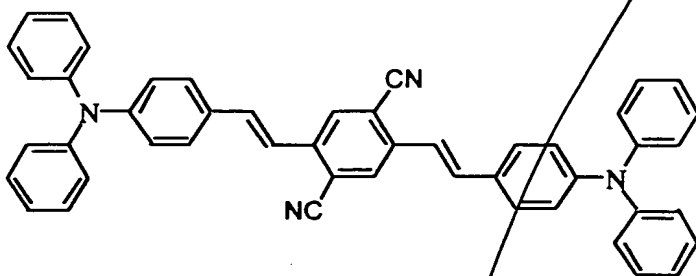
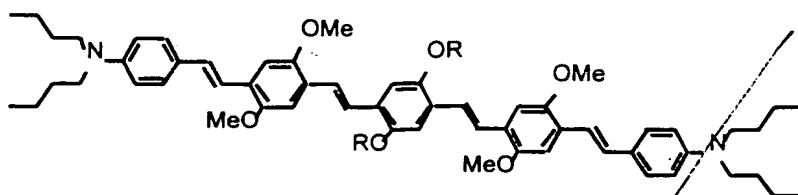
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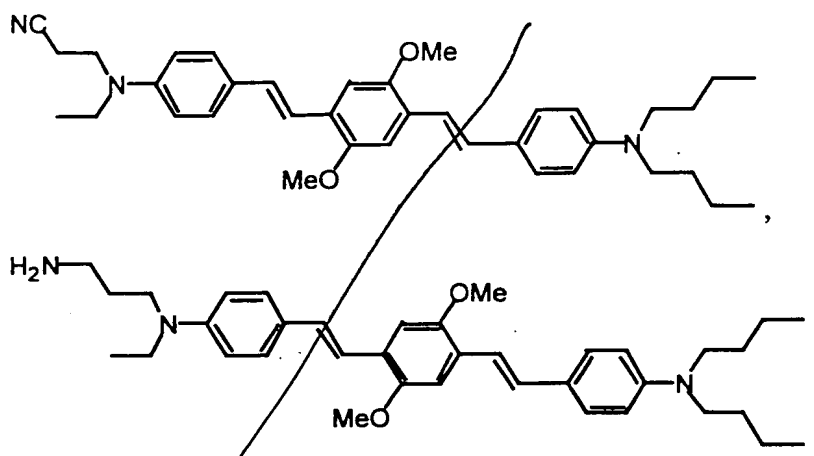
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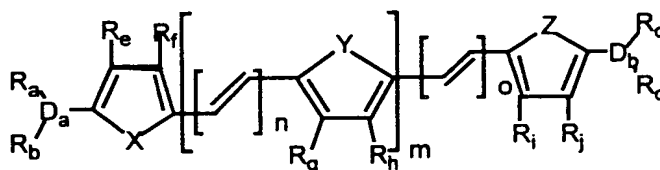
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and mixtures thereof, where $R = (CH_2)_{11}CH_3$.

- 5 4. A method according to claim 2, wherein said compound is further defined by a formula



where D_a is selected from the group consisting of N, O, S and P;

10 where D_b is selected from the group consisting of N, O, S and P;

m, n, o are integers such that $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$; and

where:

X, Y, Z are independently selected from the group consisting of:
 $CR_k=CR_l$; O; S; and N- R_m ;

15 R_a, R_b, R_c, R_d are independently selected from the group consisting of:

H; a linear or branched alkyl group with up to 25 carbons;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{a1}$;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{a2}R_{a3}$;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{a2}R_{a3}$;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$;

20 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl; where $0 < \alpha < 10$ and $1 < \beta < 25$, a group of aromatic rings having up to 20 carbons in the aromatic ring framework; fused

aromatic rings, vinyl; allyl; 4-styryl; acrolyl; methacroyl; acrylonitrile, isocyanate; isothiocyanate; epoxides; strained ring olefins; $(-\text{CH}_2)_\delta\text{SiCl}_3$; $(-\text{CH}_2)_\delta\text{Si}(\text{OCH}_2\text{CH}_3)_3$; and $(-\text{CH}_2)_\delta\text{Si}(\text{OCH}_3)_3$; where $\delta < 25$;

5 Ra_1 , Ra_2 , and Ra_3 are independently selected from the group consisting of: H; a linear or branched alkyl group with up to 25 carbons, a functional group derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or methacryloyl chloride;

10 Re , Rf , Rg , Rh , Ri , Rj , Rk , Rl and Rm are independently selected from the group consisting of: H; a linear or branched alkyl group with up to 25 carbons; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{OR}_{b1}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{NR}_{b2}\text{R}_{b3}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{CONR}_{b2}\text{R}_{b3}$, where R_{b1} , R_{b2} , and R_{b3} are independently selected from the group consisting of a functional group derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride; 15 $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{CN}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{Cl}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{Br}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{I}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{-Phenyl}$, where $0 < \alpha < 10$ and $1 < \beta < 25$; a group of aromatic rings having up to 20 carbons in the aromatic framework; fused aromatic rings; CHO; CN; NO₂; Br; Cl; I; phenyl; an acceptor group containing more than two carbon atoms; a functional group derived from an amino acid and $\text{NR}_{e1}\text{Re}_2$; OR_{e3} ; where Re_1 , Re_2 , Re_3 are defined as for R_n and R_o , where R_n and R_o are defined as any member of the group consisting of H; a linear or branched alkyl group with up to 25 carbons; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{OR}_{g1}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{NR}_{g2}\text{R}_{g3}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{CONR}_{g2}\text{R}_{g3}$; 25 $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{CN}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{Cl}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{Br}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{I}$; $(-\text{CH}_2\text{CH}_2\text{O})_\alpha(-\text{CH}_2)_\beta\text{-Phenyl}$; aryl groups; fused aromatic rings; polymerizable functionalities;

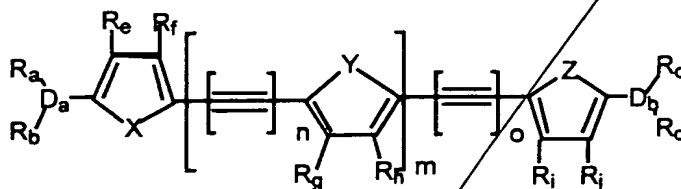
30 R_{g1} , R_{g2} , and R_{g3} are independently selected from: H; a linear or branched alkyl group with up to 25 carbons; a functional group derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin;

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ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride.

5. A method according to claim 1, wherein said compound is further defined
5 by a formula



where D_a is selected from the group consisting of N, O, S and P;

where D_b is selected from the group consisting of N, O, S and P;

m, n, o are integers such that $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$; and

10 where:

X, Y, Z are independently selected from the group consisting of:
 $CR_k=CR_l$; O; S; and $N-R_m$;

- R_a, R_b, R_c, R_d are independently selected from the group consisting of:
H; a linear or branched alkyl group with up to 25 carbons;
15 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{a1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{a2}R_{a3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{a2}R_{a3}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ Phenyl; where $0 < \alpha < 10$ and $1 < \beta < 25$, a group of
aromatic rings having up to 20 carbons in the aromatic ring framework; fused
20 aromatic rings, vinyl; allyl; 4-styryl; acroyl; methacryl; acrylonitrile, isocyanate;
isothiocyanate; epoxides; strained ring olefins; $(-CH_2)_\delta SiCl_3$;
 $(-CH_2)_\delta Si(OCH_2CH_3)_3$; and $(-CH_2)_\delta Si(OCH_3)_3$; where $\delta < 25$;

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Ra1, Ra2, and Ra3 are independently selected from the group consisting of: H; a linear or branched alkyl group with up to 25 carbons, a functional group derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or methacryloyl chloride;

Re, Rf, Rg, Rh, Ri, Rj, Rk, Rl and Rm are independently selected from the group consisting of: H; a linear or branched alkyl group with up to 25 carbons; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{b1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{b2}R_{b3}$;

$-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{b2}R_{b3}$, where Rb1, Rb2, and Rb3 are independently selected from a functional group derived from an amino acid, a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl, where $0 < \alpha < 10$ and $1 < \beta < 25$; a group of aromatic rings having up to 20 carbons in the aromatic framework; fused aromatic rings; CHO; CN; NO₂; Br; Cl; I; phenyl; an acceptor group containing more than two carbon atoms; a functional group derived from an amino acid and $NR_{e1}R_{e2}$; OR_{e3} ; where Re1, Re2, Re3 are defined as for R_n and R_o, where R_n and R_o are defined as any member of the group consisting of H; a linear or branched alkyl group with up to 25 carbons; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{g1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{g2}R_{g3}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{g2}R_{g3}$;

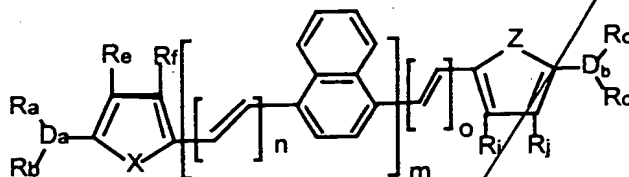
$-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl; aryl groups; fused aromatic rings; polymerizable functionalities;

Rg1, Rg2, and Rg3 are independently selected from: H; a linear or branched alkyl group with up to 25 carbons; a functional group derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride.

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6. A method according to claim 1, wherein said compound is further defined by a formula



5 where D_a is selected from the group consisting of N, O, S and P;
 where D_b is selected from the group consisting of N, O, S and P;
 m, n, o are integers such that $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$; and
 where:

10 X, Y, Z are independently selected from the group consisting of:
 $CR_k=CR_l$; O; S; and N- R_m ;

R_a , R_b , R_c , R_d are independently selected from the group consisting of:
 H; a linear or branched alkyl group with up to 25 carbons;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{a1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{a2}R_{a3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{a2}R_{a3}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$;
 15 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl; where $0 < \alpha < 10$ and $1 < \beta < 25$, a group of
 aromatic rings having up to 20 carbons in the aromatic ring framework; fused
 aromatic rings, vinyl; allyl; 4-styryl; acroyl; methacroyl; acrylonitrile, isocyanate;
 isothiocyanate; epoxides; strained ring olefins; $(-CH_2)_\delta SiCl_3$;
 20 $(-CH_2)_\delta Si(OCH_2CH_3)_3$; and $(-CH_2)_\delta Si(OCH_3)_3$; where $\delta < 25$;

R_{a1} , R_{a2} , and R_{a3} are independently selected from the group consisting
 of: H; a linear or branched alkyl group with up to 25 carbons, a functional group
 derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine;
 uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or
 25 methacryloyl chloride;

R_e , R_f , R_i , R_j , R_k , R_l and R_m are independently selected from the group
 consisting of: H; a linear or branched alkyl group with up to 25 carbons;

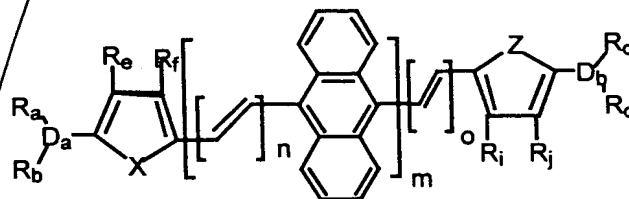
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$-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{b1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{b2}R_{b3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{b2}R_{b3}$, where R_{b1} , R_{b2} , and R_{b3} are independently
 selected from a functional group derived from an amino acid; a polypeptide;
 adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene,
 5 cyanuric chloride and derivatives thereof or methacryloyl chloride;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl, where $0 < \alpha < 10$ and $1 < \beta < 25$; a group of aromatic rings having up to 20 carbons in the aromatic
 framework; fused aromatic rings; CHO; CN; NO₂; Br; Cl; I; phenyl; an acceptor
 10 group containing more than two carbon atoms; a functional group derived from an
 amino acid and $NR_{e1}R_{e2}$; OR_{e3} ; where R_{e1} , R_{e2} , R_{e3} are defined as for R_n and
 R_o , where R_n and R_o are defined as any member of the group consisting of H; a
 linear or branched alkyl group with up to 25 carbons; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{g1}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{g2}R_{g3}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{g2}R_{g3}$;
 15 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl; aryl groups; fused
 aromatic rings; polymerizable functionalities;

R_{g1} , R_{g2} , and R_{g3} are independently selected from: H; a linear or
 branched alkyl group with up to 25 carbons; a functional group derived from an
 20 amino acid: a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin;
 ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl
 chloride.

7. A method according to claim 1, wherein said compound is further defined
 25 by a formula



where D_a is selected from the group consisting of N, O, S and P;

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where D_b is selected from the group consisting of N, O, S and P;
 m, n, o are integers such that $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$; and
 where:

X, Y, Z are independently selected from the group consisting of:
 5 $CR_k=CR_l$; O; S; and $N-R_m$;

R_a, R_b, R_c, R_d are independently selected from the group consisting of:
 H; a linear or branched alkyl group with up to 25 carbons;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{a1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{a2}R_{a3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{a2}R_{a3}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$;
 10 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl; where $0 < \alpha < 10$ and $1 < \beta < 25$, a group of
 aromatic rings having up to 20 carbons in the aromatic ring framework; fused
 aromatic rings, vinyl; allyl; 4-styryl; acroyl; methacroyl; acrylonitrile, isocyanate;
 isothiocyanate; epoxides; strained ring olefins; $-(CH_2)_\delta SiCl_3$;
 15 $-(CH_2)_\delta Si(OCH_2CH_3)_3$; and $-(CH_2)_\delta Si(OCH_3)_3$; where $\delta < 25$;

$R_{a1}, R_{a2},$ and R_{a3} are independently selected from the group consisting
 of: H; a linear or branched alkyl group with up to 25 carbons, a functional group
 derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine;
 uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or
 20 methacryloyl chloride;

$R_e, R_f, R_i, R_j, R_k, R_l$ and R_m are independently selected from the group
 consisting of: H; a linear or branched alkyl group with up to 25 carbons;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{b1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{b2}R_{b3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{b2}R_{b3}$, where $R_{b1}, R_{b2},$ and R_{b3} are independently
 25 selected from the group consisting of a functional group derived from an amino
 acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene,
 ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl, where $0 < \alpha < 10$ and $1 <$
 30 $\beta < 25$; a group of aromatic rings having up to 20 carbons in the aromatic

09918874-073001

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framework; fused aromatic rings; CHO; CN; NO₂; Br; Cl; I; phenyl; an acceptor group containing more than two carbon atoms; a functional group derived from an amino acid and NR_{e1}R_{e2}; OR_{e3}; where R_{e1}, R_{e2}, R_{e3} are defined as for R_n and R_o, where R_n and R_o are defined as any member of the group consisting of H; a
 5 linear or branched alkyl group with up to 25 carbons; -(CH₂CH₂O)_α-(CH₂)_βOR_{g1};
 -(CH₂CH₂O)_α-(CH₂)_βNR_{g2}R_{g3}; -(CH₂CH₂O)_α-(CH₂)_βCONR_{g2}R_{g3};
 -(CH₂CH₂O)_α-(CH₂)_βCN; -(CH₂CH₂O)_α-(CH₂)_βCl; -(CH₂CH₂O)_α-(CH₂)_βBr;
 -(CH₂CH₂O)_α-(CH₂)_βI; -(CH₂CH₂O)_α-(CH₂)_β-Phenyl; aryl groups; fused
 aromatic ring; polymerizable functionalities;

10 R_{g1}, R_{g2}, and R_{g3} are independently selected from: H; a linear or
 branched alkyl group with up to 25 carbons; a functional group derived from an
 amino acid: a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin;
 ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl
 chloride.

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8. A method according to claim 1, wherein said bridge is substituted with one
 or more electron acceptor groups.

9. A method for preparing a compound in an electronically excited state,
 20 comprising the steps of:

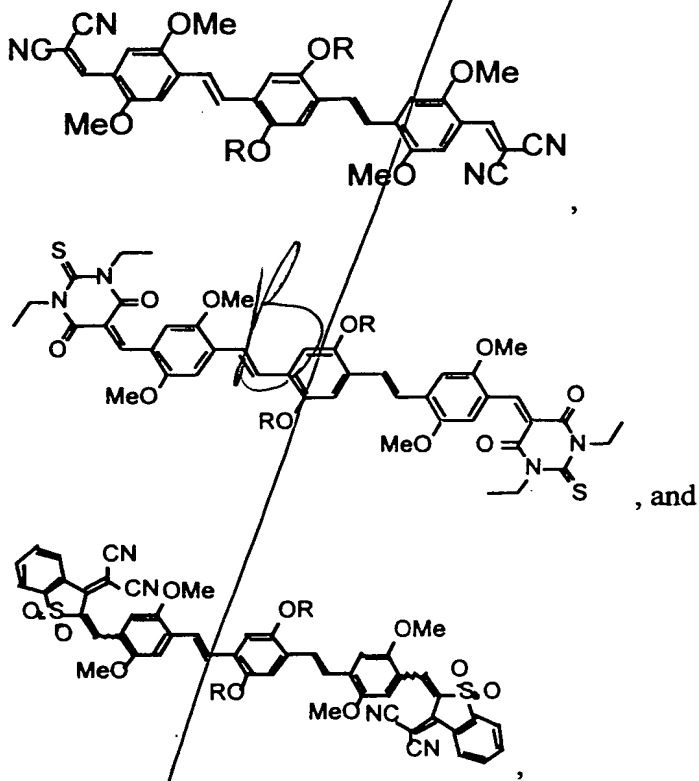
a) exposing a compound having the formula A₁-Π-A₂ to radiation,
 wherein A₁ and A₂ are electron acceptors; and Π comprises a bridge of π-
 conjugated bonds connecting A₁ and A₂; and

b) converting said compound to a multi-photon electronically excited
 25 state upon simultaneous absorption of at least two photons of said radiation by said
 compound, wherein the sum of the energies of all of said absorbed photons is
 greater than or equal to the transition energy from a ground state of said compound
 to said multi-photon excited state and wherein the energy of each absorbed photon
 is less than the transition energy between said ground state and the lowest single-

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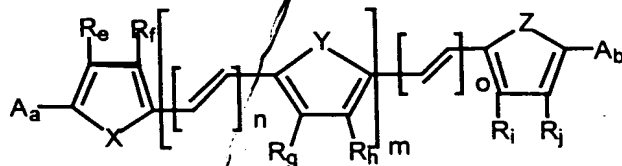
photon excited state of said compound and is less than the transition energy between said multi-photon excited state and said ground state.

10. A method according to claim 9, wherein said compound is selected from the group consisting of

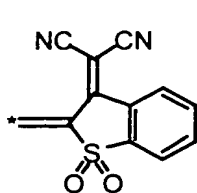


where $R = (CH_2)_{11}CH_3$.

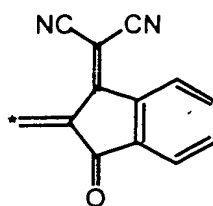
11. A method according to claim 9, wherein said compound is further defined by a formula



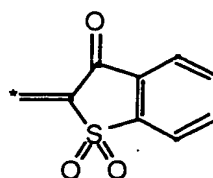
where A_a and A_b can be independently selected from: CHO; CN; NO_2 , and



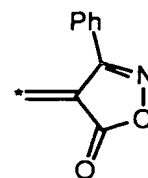
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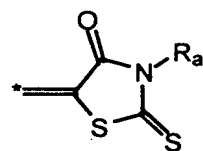
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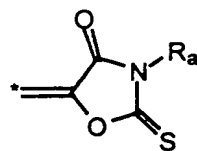
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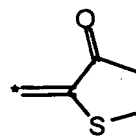
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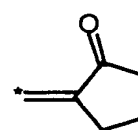
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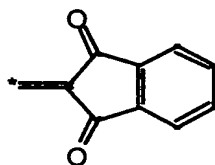
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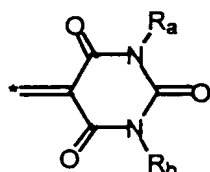
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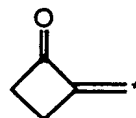
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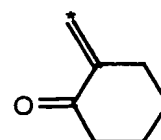
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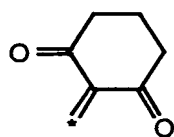
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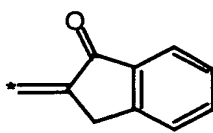
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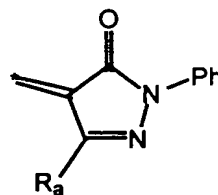
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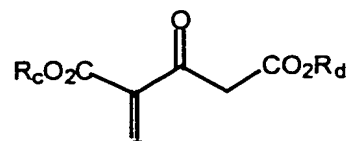
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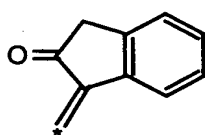
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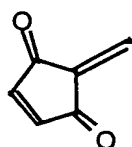
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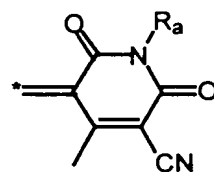
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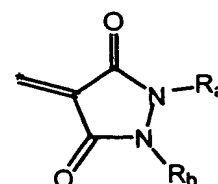
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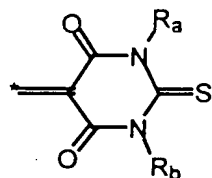


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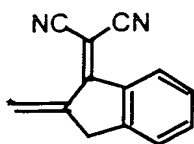


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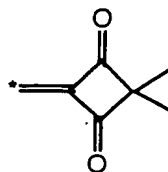
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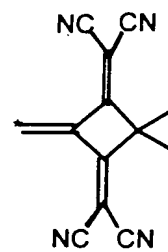
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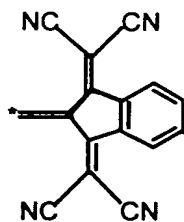
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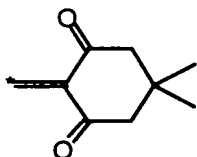
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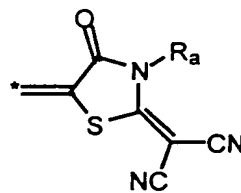
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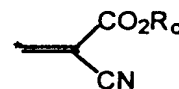
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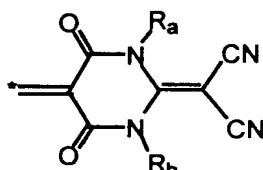
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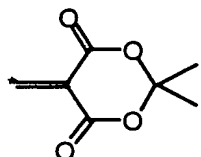
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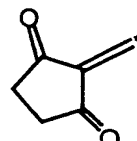
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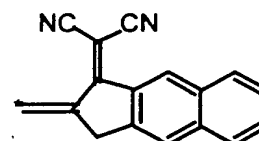
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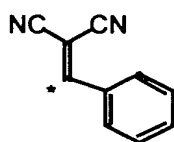
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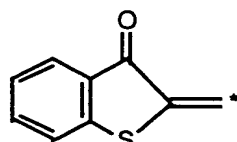
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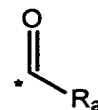
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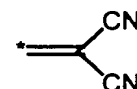
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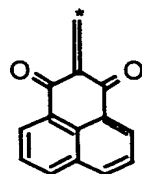
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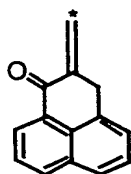
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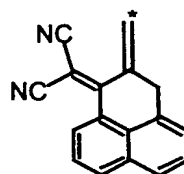
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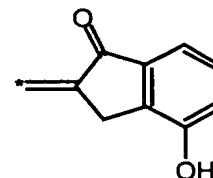
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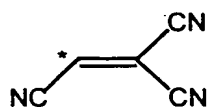
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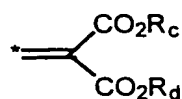
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in addition A_a and A_b can be independently selected from Br, Cl, and I; and
 5 where $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$.

and where:

X, Y, Z are independently selected from the group consisting of: $\text{CR}_k=\text{CR}_l$; O; S; and N-R_m ;

R_a , R_b , R_c , R_d are independently selected from the group consisting of:

- 5 H; a linear or branched alkyl group with up to 25 carbons;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{OR}_{a1}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{NR}_{a2}\text{R}_{a3}$;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{CONR}_{a2}\text{R}_{a3}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{CN}$;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{Cl}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{Br}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{I}$;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{-Phenyl}$; where $0 < \alpha < 10$ and $1 < \beta < 25$, a group of
 10 aromatic rings having up to 20 carbons in the aromatic ring framework; fused
 aromatic rings, vinyl; allyl; 4-styryl; acroyl; methacroyl; acrylonitrile, isocyanate;
 isothiocyanate; epoxides; strained ring olefins; $(-\text{CH}_2)_\delta\text{SiCl}_3$;
 $(-\text{CH}_2)_\delta\text{Si}(\text{OCH}_2\text{CH}_3)_3$; and $(-\text{CH}_2)_\delta\text{Si}(\text{OCH}_3)_3$; where $\delta < 25$;

- 15 R_{a1} , R_{a2} , and R_{a3} are independently selected from the group consisting
 of: H; a linear or branched alkyl group with up to 25 carbons, a functional group
 derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine;
 uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or
 methacryloyl chloride;

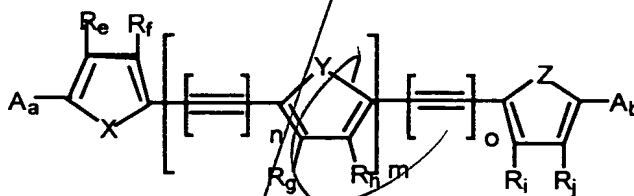
- 20 R_e , R_f , R_g , R_h , R_i , R_j , R_k , R_l and R_m are independently selected from the
 group consisting of: H; a linear or branched alkyl group with up to 25 carbons;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{OR}_{b1}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{NR}_{b2}\text{R}_{b3}$;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{CONR}_{b2}\text{R}_{b3}$, where R_{b1} , R_{b2} , and R_{b3} are independently
 selected from the group consisting of a functional group derived from an amino
 acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene,
 25 ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{CN}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{Cl}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{Br}$;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{I}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{-Phenyl}$, where $0 < \alpha < 10$ and $1 <$
 $\beta < 25$; a group of aromatic rings having up to 20 carbons in the aromatic
 framework; fused aromatic rings; CHO; CN; NO_2 ; Br; Cl; I; phenyl; an acceptor
 30 group containing more than two carbon atoms; a functional group derived from an

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amino acid and $\text{NR}_{e1}\text{R}_{e2}$; OR_{e3} ; where R_{e1} , R_{e2} , R_{e3} are defined as for R_n and R_o , where R_n and R_o are defined as any member of the group consisting of H; a linear or branched alkyl group with up to 25 carbons; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{OR}_{g1}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{NR}_{g2}\text{R}_{g3}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{CONR}_{g2}\text{R}_{g3}$;
 5 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{CN}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{Cl}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{Br}$;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{I}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha-(\text{CH}_2)_\beta\text{-Phenyl}$; aryl groups; fused aromatic rings; polymerizable functionalities;

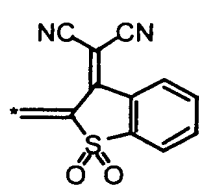
R_{g1} , R_{g2} , and R_{g3} are independently selected from: H; a linear or branched alkyl group with up to 25 carbons; a functional group derived from an amino acid; or a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride.

12. A method according to claim 9, wherein said compound is further defined
 15 by a formula

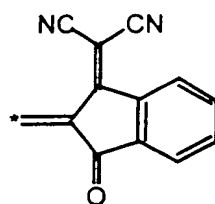


where A_a and A_b can be independently selected from: CHO ; CN ; NO_2 , and

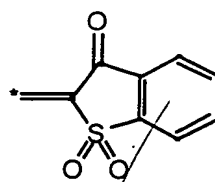
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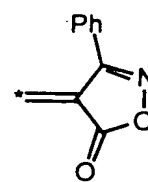
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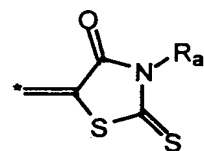
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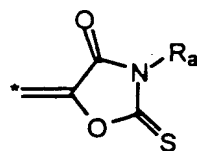
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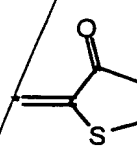
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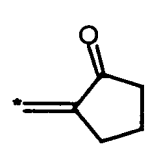
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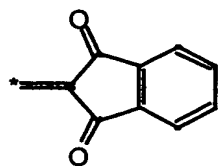
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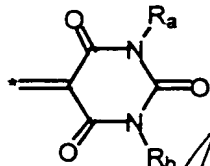
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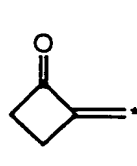
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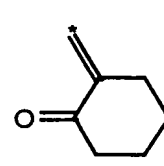
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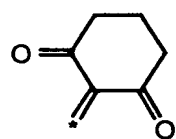
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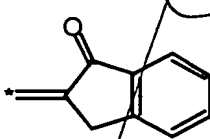
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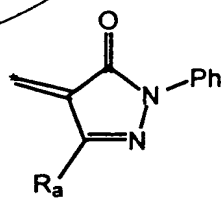
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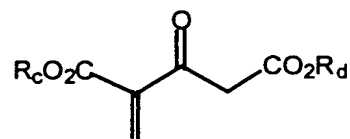
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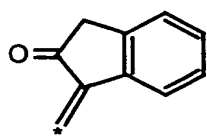
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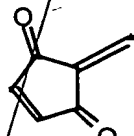
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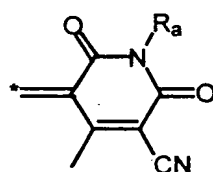
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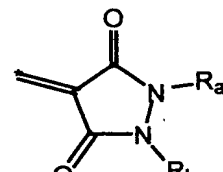
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A18

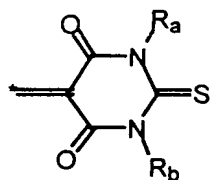


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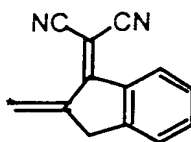


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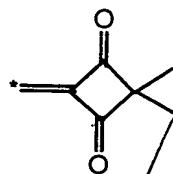
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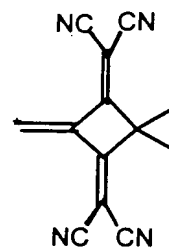
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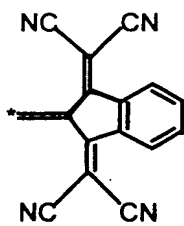
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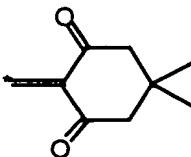
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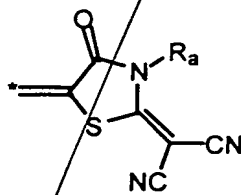
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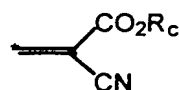
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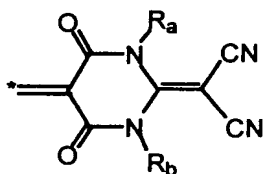
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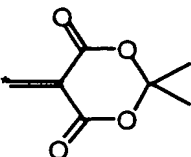
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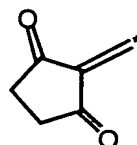
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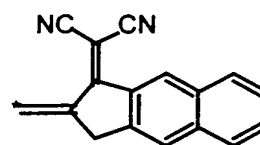
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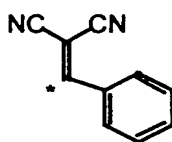
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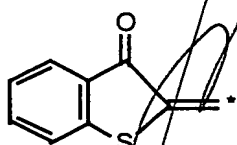
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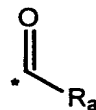
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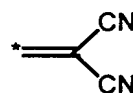
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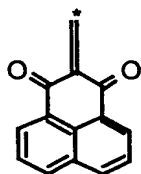
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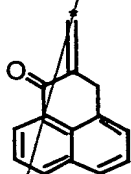
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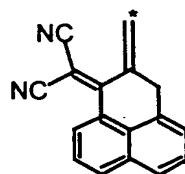
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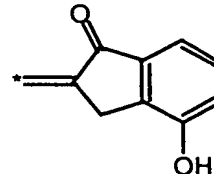
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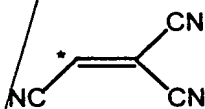
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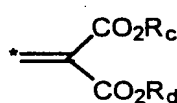
A39



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in addition A_a and A_b can be independently selected from Br, Cl, and I; and
 5 where $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$.

; and where:

X, Y, Z are independently selected from the group consisting of: $CR_k=CR_l$; O; S; and N- R_m ;

R_a , R_b , R_c , R_d are independently selected from the group consisting of:

5 H; a linear or branched alkyl group with up to 25 carbons;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{a1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{a2}R_{a3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{a2}R_{a3}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl; where $0 < \alpha < 10$ and $1 < \beta < 25$, a group of
 10 aromatic rings having up to 20 carbons in the aromatic ring framework; fused
 aromatic rings, vinyl; allyl; 4-styryl; acroyl; methacroyl; acrylonitrile, isocyanate;
 isothiocyanate; epoxides; strained ring olefins; $(-CH_2)_\delta SiCl_3$;
 $(-CH_2)_\delta Si(OCH_2CH_3)_3$; and $(-CH_2)_\delta Si(OCH_3)_3$; where $\delta < 25$;

R_{a1} , R_{a2} , and R_{a3} are independently selected from the group consisting
 15 of: H; a linear or branched alkyl group with up to 25 carbons, a functional group
 derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine;
 uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or
 methacryloyl chloride;

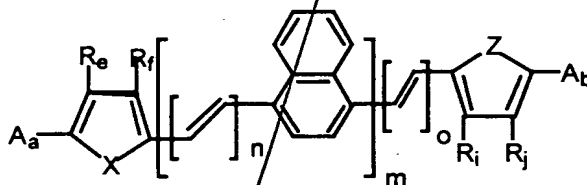
R_e , R_f , R_g , R_h , R_i , R_j , R_k , R_l and R_m are independently selected from the
 20 group consisting of: H; a linear or branched alkyl group with up to 25 carbons;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{b1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{b2}R_{b3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{b2}R_{b3}$, where R_{b1} , R_{b2} , and R_{b3} are independently
 selected from the group consisting of a functional group derived from an amino
 acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene,
 25 ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl, where $0 < \alpha < 10$ and $1 <$
 $\beta < 25$; a group of aromatic rings having up to 20 carbons in the aromatic
 framework; fused aromatic rings; CHO; CN; NO₂; Br; Cl; I; phenyl; an acceptor
 30 group containing more than two carbon atoms; a functional group derived from an

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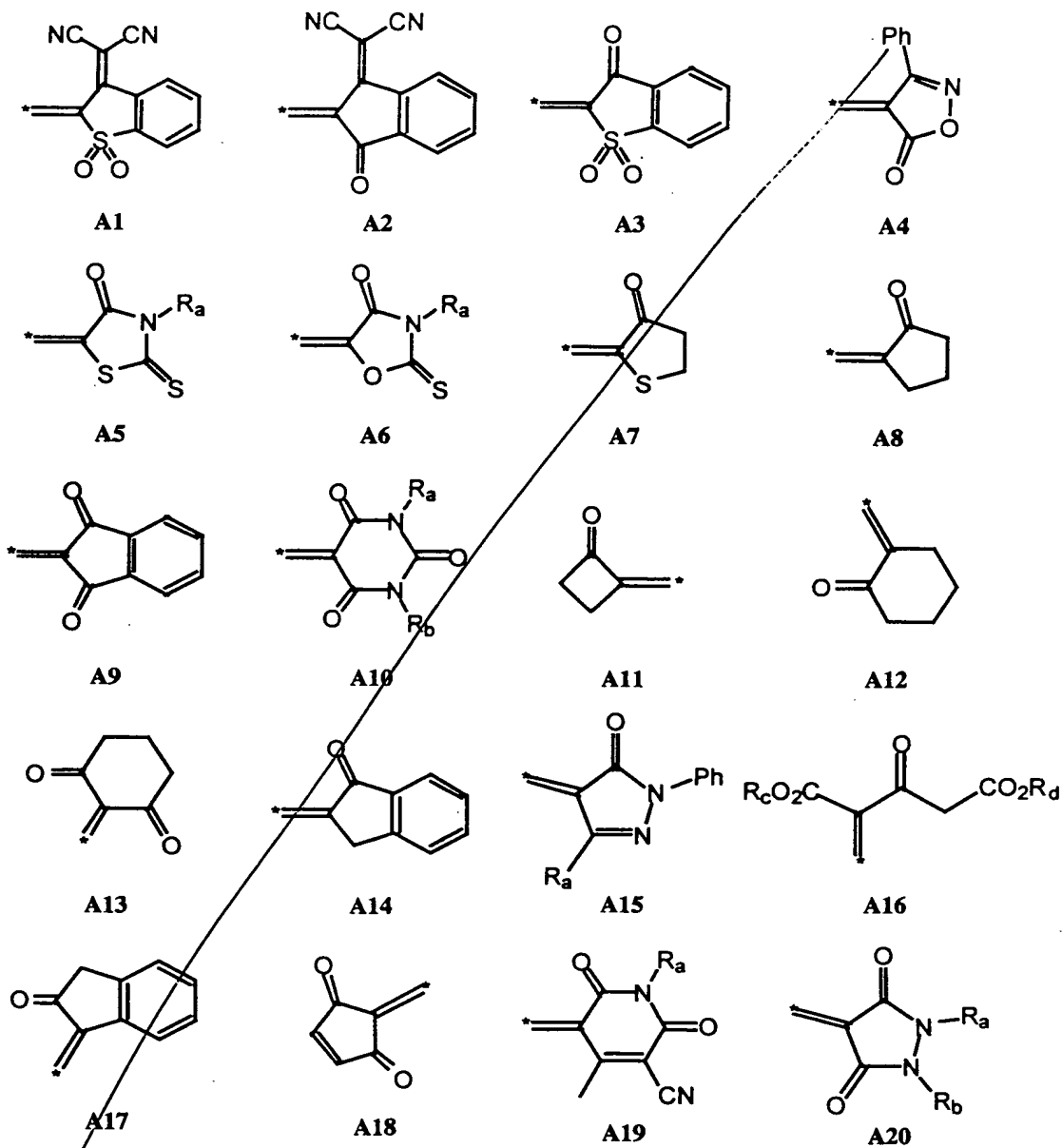
amino acid and $\text{NR}_{\text{e}1}\text{R}_{\text{e}2}$; $\text{OR}_{\text{e}3}$; where $\text{R}_{\text{e}1}$, $\text{R}_{\text{e}2}$, $\text{R}_{\text{e}3}$ are defined as for R_{n} and R_{o} , where R_{n} and R_{o} are defined as any member of the group consisting of H; a linear or branched alkyl group with up to 25 carbons; $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}\text{OR}_{\text{g}1}$; $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}\text{NR}_{\text{g}2}\text{R}_{\text{g}3}$; $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}\text{CONR}_{\text{g}2}\text{R}_{\text{g}3}$;
 5 $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}\text{CN}$; $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}\text{Cl}$; $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}\text{Br}$; $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}\text{I}$; $-(\text{CH}_2\text{CH}_2\text{O})_{\alpha}-(\text{CH}_2)_{\beta}$ -Phenyl; aryl groups; fused aromatic rings; polymerizable functionalities;

$\text{R}_{\text{g}1}$, $\text{R}_{\text{g}2}$, and $\text{R}_{\text{g}3}$ are independently selected from: H; a linear or branched alkyl group with up to 25 carbons; a functional group derived from an amino acid; or a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin;
 10 ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride.

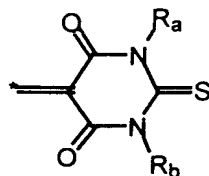
13. A method according to claim 9, wherein said compound is further defined
 15 by a formula



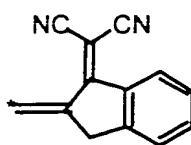
where A_a and A_b can be independently selected from: CHO; CN; NO_2 , and



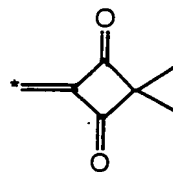
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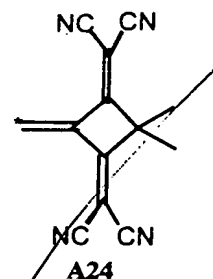
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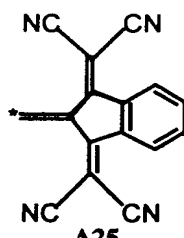
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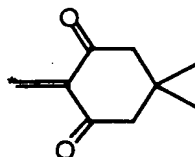
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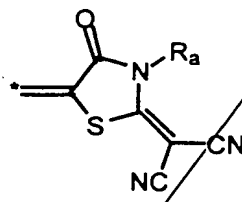
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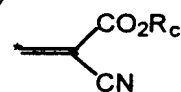
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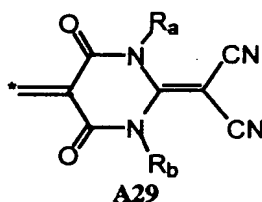
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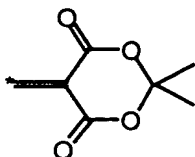
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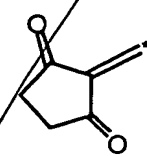
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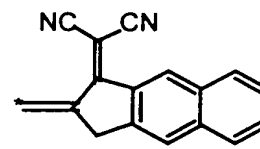
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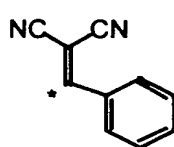
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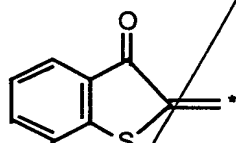
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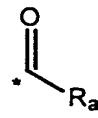
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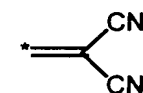
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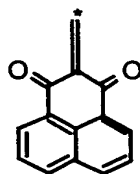
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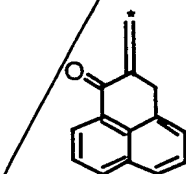
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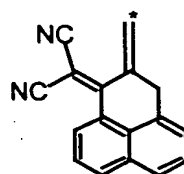
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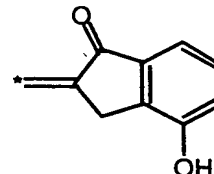
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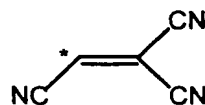
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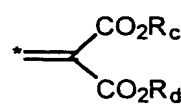
A39



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in addition A_a and A_b can be independently selected from Br, Cl, and I; and
 5 where $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$.

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; and where:

X, Y, Z are independently selected from the group consisting of:
 $CR_k=CR_l$; O; S; and N- R_m ;

R_a , R_b , R_c , R_d are independently selected from the group consisting of:

- 5 H; a linear or branched alkyl group with up to 25 carbons;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{a1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{a2}R_{a3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{a2}R_{a3}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl; where $0 < \alpha < 10$ and $1 < \beta < 25$, a group of
 10 aromatic rings having up to 20 carbons in the aromatic ring framework; fused
 aromatic rings, vinyl; allyl; 4-styryl; acrolyl; methacroyl; acrylonitrile, isocyanate;
 isothiocyanate; epoxides; strained ring olefins; $(-CH_2)_\delta SiCl_3$;
 $(-CH_2)_\delta Si(OCH_2CH_3)_3$; and $(-CH_2)_\delta Si(OCH_3)_3$; where $\delta < 25$;

- 15 R_{a1} , R_{a2} , and R_{a3} are independently selected from the group consisting
 of: H; a linear or branched alkyl group with up to 25 carbons, a functional group
 derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine;
 uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or
 methacryloyl chloride;

- 20 R_e , R_f , R_i , R_j , R_k , R_l and R_m are independently selected from the group
 consisting of: H; a linear or branched alkyl group with up to 25 carbons;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta OR_{b1}$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta NR_{b2}R_{b3}$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CONR_{b2}R_{b3}$, where R_{b1} , R_{b2} , and R_{b3} are independently
 selected from the group consisting of a functional group derived from an amino
 acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene,
 25 ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta CN$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Cl$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta Br$;
 $-(CH_2CH_2O)_\alpha-(CH_2)_\beta I$; $-(CH_2CH_2O)_\alpha-(CH_2)_\beta$ -Phenyl, where $0 < \alpha < 10$ and $1 <$
 $\beta < 25$; a group of aromatic rings having up to 20 carbons in the aromatic
 framework; fused aromatic rings; CHO; CN; NO₂; Br; Cl; I; phenyl; an acceptor
 30 group containing more than two carbon atoms; a functional group derived from an

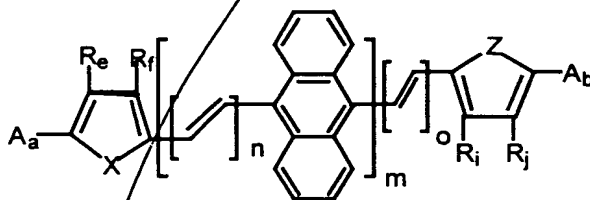
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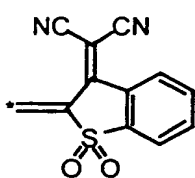
amino acid and $\text{NR}_{e1}\text{R}_{e2}$; OR_{e3} ; where R_{e1} , R_{e2} , R_{e3} are defined as for R_n and R_o , where R_n and R_o are defined as any member of the group consisting of H; a linear or branched alkyl group with up to 25 carbons; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{OR}_{g1}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{NR}_{g2}\text{R}_{g3}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{CONR}_{g2}\text{R}_{g3}$;
 5 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{CN}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{Cl}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{Br}$;
 $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{I}$; $-(\text{CH}_2\text{CH}_2\text{O})_\alpha(\text{CH}_2)_\beta\text{-Phenyl}$; aryl groups; fused aromatic rings; polymerizable functionalities;

R_{g1} , R_{g2} , and R_{g3} are independently selected from: H; a linear or branched alkyl group with up to 25 carbons; a functional group derived from an amino acid; or a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride.

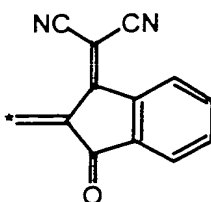
14. A method according to claim 9, wherein said compound is further defined
 15 by a formula



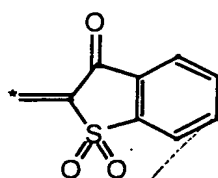
where A_a and A_b can be independently selected from: CHO; CN; NO_2 , and



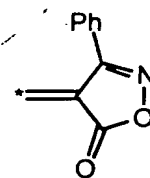
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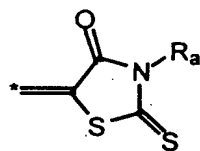
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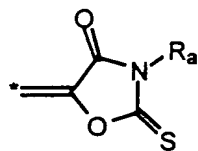
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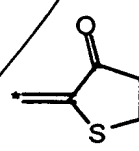
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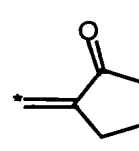
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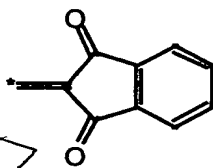
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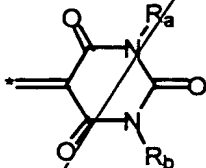
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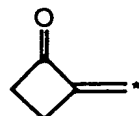
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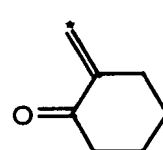
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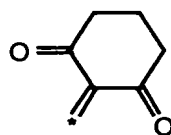
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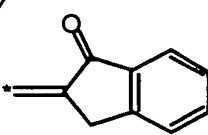
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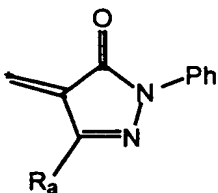
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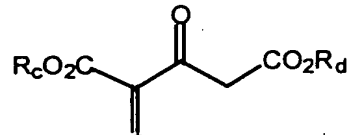
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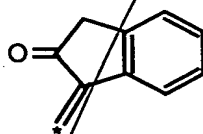
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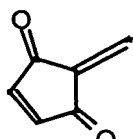
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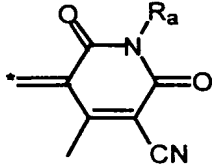
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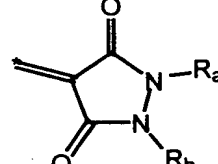
A17



A18



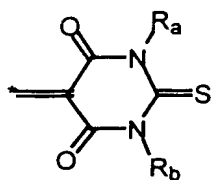
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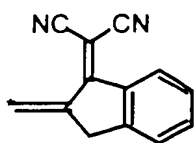
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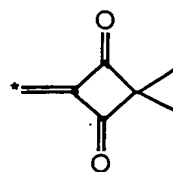
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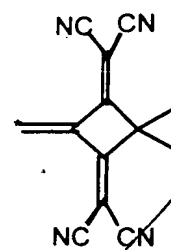
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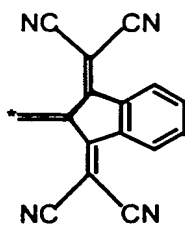
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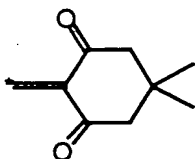
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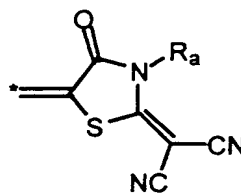
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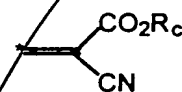
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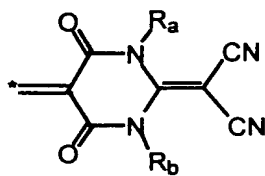
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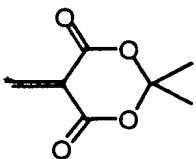
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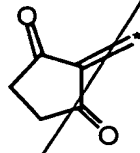
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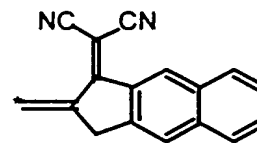
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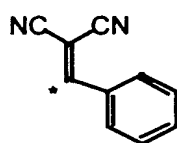
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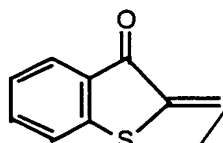
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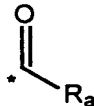
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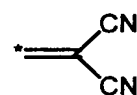
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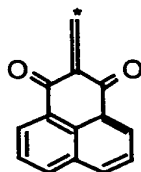
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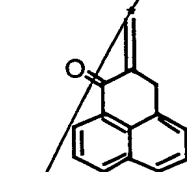
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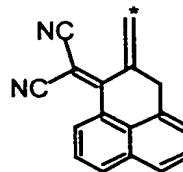
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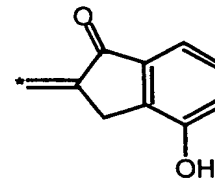
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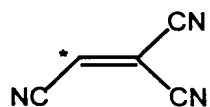
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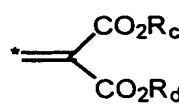
A39



A40



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in addition A_a and A_b can be independently selected from Br, Cl, and I; and
 5 where $0 \leq m \leq 10$, $0 \leq n \leq 10$, $0 \leq o \leq 10$.

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; and where:

X, Y, Z are independently selected from the group consisting of:
CR_k=CR_j; O; S; and N-R_m;

R_a, R_b, R_c, R_d are independently selected from the group consisting of:

- 5 H; a linear or branched alkyl group with up to 25 carbons;
 -(CH₂CH₂O)_α-(CH₂)_βOR_{a1}; -(CH₂CH₂O)_α-(CH₂)_βNR_{a2}R_{a3};
 -(CH₂CH₂O)_α-(CH₂)_βCONR_{a2}R_{a3}; -(CH₂CH₂O)_α-(CH₂)_βCN;
 -(CH₂CH₂O)_α-(CH₂)_βCl; -(CH₂CH₂O)_α-(CH₂)_βBr; -(CH₂CH₂O)_α-(CH₂)_βI;
 -(CH₂CH₂O)_α-(CH₂)_β-Phenyl; where 0 < α < 10 and 1 < β < 25, a group of
 10 aromatic rings having up to 20 carbons in the aromatic ring framework; fused
 aromatic rings, vinyl; allyl; 4-styryl; acroyl; methacroyl; acrylonitrile, isocyanate;
 isothiocyanate; epoxides; strained ring olefins; (-CH₂)_δSiCl₃;
 (-CH₂)_δSi(OCH₂CH₃)₃; and (-CH₂)_δSi(OCH₃)₃; where δ < 25;

- 15 R_{a1}, R_{a2}, and R_{a3} are independently selected from the group consisting
 of: H; a linear or branched alkyl group with up to 25 carbons, a functional group
 derived from an amino acid; a polypeptide; adenine; guanine; tyrosine; cytosine;
 uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof, or
 methacryloyl chloride;

- 20 R_e, R_f, R_i, R_j, R_k, R_l and R_m are independently selected from the group
 consisting of: H; a linear or branched alkyl group with up to 25 carbons;
 -(CH₂CH₂O)_α-(CH₂)_βOR_{b1}; -(CH₂CH₂O)_α-(CH₂)_βNR_{b2}R_{b3};
 -(CH₂CH₂O)_α-(CH₂)_βCONR_{b2}R_{b3}, where R_{b1}, R_{b2}, and R_{b3} are independently
 selected from the group consisting of a functional group derived from an amino
 acid; a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene,
 25 ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride;
 -(CH₂CH₂O)_α-(CH₂)_βCN; -(CH₂CH₂O)_α-(CH₂)_βCl; -(CH₂CH₂O)_α-(CH₂)_βBr;
 -(CH₂CH₂O)_α-(CH₂)_βI; -(CH₂CH₂O)_α-(CH₂)_β-Phenyl, where 0 < α < 10 and 1 <
 β < 25; a group of aromatic rings having up to 20 carbons in the aromatic
 framework; fused aromatic rings; CHO; CN; NO₂; Br; Cl; I; phenyl; an acceptor
 30 group containing more than two carbon atoms; a functional group derived from an

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5 ~~-(CH₂CH₂O)_α-(CH₂)_βCN; -(CH₂CH₂O)_α-(CH₂)_βCl; -(CH₂CH₂O)_α-(CH₂)_βBr;~~
~~-(CH₂CH₂O)_α-(CH₂)_βI; -(CH₂CH₂O)_α-(CH₂)_β-Phenyl; aryl groups; fused~~
~~aromatic rings; polymerizable functionalities;~~

10 amino acid; or a polypeptide; adenine; guanine; tyrosine; cytosine; uracil; biotin; ferrocene, ruthenocene, cyanuric chloride and derivatives thereof or methacryloyl chloride.

15 or more electron donor groups.